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Nestling Technology Between Life-enhancing Environments and Caring Community Services

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Abstract. Current approaches to managing the well-being and care needs of our growing ageing population are unsustainable. By shifting the balance from acute and long term settings towards independent living in their own environments, it may be possible to improve outcomes while at the same time to decrease overall health costs for ageing people in the long term. Funding a successful transition to a 'smart home - smart care' model requires public policy commitment, which in turn requires a strong evidence base to underpin policy decision-making. This paper discusses a multi-agency collaborative project in the North East of Ireland, currently in its inception phase. The project's goal is to increase and accelerate the opportunity for ageing and frail people in our community to have safe, comfortable, fulfilling and stimulating lives in their own homes. The project focus is to establish a scaleable framework for developing an evidence base, built around a comparative analysis of a demonstrator project along-side a control sample using existing models of care.

Keywords. Smart home, Smart House, Independent Living, Ageing, Community Services

Introduction

The Nestling Technology Initiative is a collaborative venture in the North-east of Ireland. The project aims to provide environments that promote and sustain independence and well-being for older people through the fusion of innovative spatial, technology and integrated community care-based approaches. This will be achieved by the development of an integrated care demonstration model in Dundalk; the building of capability through evidence development, innovation, awareness and continuous process improvement; growing the project's reach and impact through geographic expansion, service intensification, advocacy and public policy development; and developing a business model for sustainable, continued growth.

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1. The Context

1.1. Demographic Trends

Current approaches to managing the well-being and care needs of our growing ageing population are unsustainable. Demographic trends predict that the population aged 65 years and over in Ireland will be 520,000 by 2011 and will represent 14% of the total population [1]. It is estimated that between 2000 and 2050, public health expenditure for acute health care will rise from 5.9% to 8.2% of Ireland's GDP. In addition, the level of annual expenditure for long term care is estimated to rise from 0.7% in 2000 to almost 1% by 2050 [2]. Currently, the ratio of people of working age to people over 65 is 3.7 to 1. Over the next 40 years, that is likely to fall to 2 to 1, meaning there will be less tax money for government to fund long-term care.

The challenge facing providers is to create systems which optimise wellness, incorporating health prevention, health promotion and early detection with health care intervention and caregiver support. Such systems could leverage non-intrusive technologies to empower the ageing to take greater responsibility for their own health and social well-being. By shifting the balance from acute and long term settings towards independent living in their own environments, it may be possible to improve outcomes while at the same time to decrease overall health costs for ageing people in the long term.

1.2. The Environment

From the individual's perspective, 'ageing-in-place' is about motivation, self-belief and confidence, and all of these aspects are bound up in a complex interplay between the nature of the home environment and its neighbourhood, the individual's health, and the availability of supporting services from the community.

Empowering ageing people to continuously mould their home environment and to source and configure services to match their evolving needs and capabilities is an essential aspect of any strategy that is aimed at promoting independent living in the community. But the problem here is that often the existing home environment isn't suitable spatially, ergonomically, ecologically or economically; and it is not easily adaptable to accommodate assistive technologies or to be tailored to the specific functional needs of individual older people with varying ranges and states of diminishing capabilities. Additionally, sourcing, accessing, funding and receiving the right mix of services to support them living at home can be bewildering, as they are provided by an overlapping set of government departments, agencies and voluntary support groups that are not yet well joined-up.

The core of the problem seems to be in finding an appropriate holistic response that finds the right affordable and sustainable balance in providing a living, life-enriching home environment, enveloped by a cohesive community support infrastructure that is proactive in helping ageing people to maintain and develop their well-being.

2. The Project Objective

The overall project focus is to establish a framework for developing an evidence base that can underpin public policy commitment for investment in ‘aware homes’ and ‘integrated community care’ as a means to increase the opportunity for independent living and ‘ageing-in-place’, and to reduce the pressure for long term institutional settings for ageing people and those with cognitive decline.

For the purposes of the project, the definition of an ‘aware home’ that has been adopted is broader than ‘a technologically augmented environment’, and is taken to also encompass current best-practice in relation to accessibility and ergonomics, as well as best-practice design for sustainable environments, with particular reference to the well-being of the ageing and those with cognitive impairment [3]. ‘Integrated community care’ is taken to mean an efficient and integrated model of care delivery that puts the client at the centre of the model. From the clients’ perspective, it is seen as a co-ordinated source of easily accessible care and services that can be configured to meet their unique circumstances, and that is delivered in a timely and pro-active manner. From the service provider’s perspective, it is seen as a highly integrated, self-organising multi-disciplinary care team, accepting collective responsibility for maximising their client’s health and wellness, and operating with a minimum of bureaucracy.

3. The Methodology

The Nestling Technology programme of activity is organised into three interwoven vertical streams, enveloped by an overall programme management function which includes evaluation and communication. The three streams relate to the Barrack St Demonstrator, the Capability Development Programme, and Developing Capacity (influence, impact and sustainability).

3.1. The Barrack St. Demonstrator

The demonstration project is to be located in Barrack St., Dundalk, a kilometre from the town centre, within 200m of local amenities and adjacent to a proposed primary care centre. The main elements of this stream include the design and building of a sustainable physical environment – the 12 home units, the shared community facility and the immediate neighbourhood/street; the putting in place of the information and communication technology infrastructure within the home environment, and the family / community care teams; the selection and preparation of a broker model and an integrated care team for service delivery and pro-active home/service monitoring; and the configuration and delivery of the services to the occupants and other out-reach clients, including continuous local service evaluation and adaptation.

3.2. Capability and Evidence Development

The primary elements of capability and evidence development are evidence development, innovation and applied research, process development and product/service strategy development. *Evidence development* is based on a comparative

analysis framework between target and control groups. The initial sample will occupy 12 units, and will broaden in spatial and time domains over the project's duration as the project extends to retrofits of existing dwellings. *Innovation and applied research*, by working with regional, national and international partners to assist in bringing forward innovative and reliable in-home and in-community applications and services to support ageing peoples' independent living. Here the focus is on requirements development and specifications, standards development and interoperability, and integrated acceptance testing. *Process development*, where these activities are aimed at embedding incremental models of continuous process improvement (capability maturity models) within and between the cooperating domains of collaborative community care, built environment design and technology provision. *Product/Service Strategy development*, with detailed business planning for the forward growth, sustainability, financing, branding and positioning of the project. Focus on the replication components (models, tools, practices, standards) and their methods of replication, as the basis for growth.

3.3. Developing Capacity

Growing capacity and maximising the project's take-up and roll-out (assuring sustainability) will be dependent upon strengthening public policy commitment to the 'aware home/integrated care model', and ensuring that commitments are followed up with coordinated implementation. Activities will develop and pursue the *policy implications* on entitlements, budget alignments, public service and process organisation, care practices, assessments, voluntary support, service quality assurance and information sharing ethics & privacy, for example. They will also develop the project's broader *geographic reach* through town, county, regional, national and international expansion, and will address technical retrofit/upgrade models for existing homes. *Community/Service intensification* will broaden and deepen the range of service provision.

4. Conclusion

This paper has discussed a multi-agency collaborative project in the North East of Ireland, currently in its inception phase. The project's goal is to increase and accelerate the opportunity for ageing and frail people in our community to have safe, comfortable, fulfilling and stimulating lives in their own homes. The project focus is to establish a scaleable framework for developing an evidence base, built around a comparative analysis of a demonstrator project along-side a control sample using existing models of care.

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